

Presentation to
IBM Corporation
on
**Intermediate-Sized Internal
Systems Utilized by Information
Services Vendors**

by INPUT

April 29, 1988



AGENDA

- Objectives and Methodology
- Sample Characteristics
- Summary Conclusions and Recommendations
- Buying Motives
- Manufacturers' Relative Strengths and Weaknesses
- Comparative Importance and Satisfaction Ratings
- Comments from Vendors
- Applications in Use
- Future Purchase Intentions

ZISC-2



OBJECTIVES

- Determine Information Services (IS) Firms' Buying Motives in Selecting Internal Systems of Intermediate Size (\$20,000-\$1,000,000)
- Measure Market Presence, Strengths, and Weaknesses for HP, DEC, and IBM in This Specific Submarket
- Measure IS Vendors' Relative Satisfaction and Importance Ratings for Their Internal Systems
- Determine Most-Important Internal Applications Being Performed
- Measure IS Vendors' Future Buying Intentions
- Determine Reasons for IS Vendors Continuing to Purchase from HP, DEC, and IBM; Also Determine Their Reasons for Changing Manufacturers
- Recommend Actions for IBM to Increase Market Penetration

ZISC-3



PROJECT METHODOLOGY

- Survey Design/Approval, with IBM
- Random Telephone Surveys (120 Target).
Concentration on Vendors Who Gave IBM Serious Consideration
- Target Minimum Numbers of Processing Services, Turnkey Systems, and Software Products Firms, by Three Size Groups
 - Small: <\$10 M Revenues
 - Large: \$10M-100M Revenues
 - Very Large: >\$100 M Revenues
- Initial Feedback/Analysis
- Nonrandom Telephone Surveys: Focus on DEC/HP Users
- Tabulation
- Analysis/Recommendations

ZISC-4



SAMPLE CHARACTERISTICS

157 Random Telephone Interviews

A.

33 Mainframe Users	85 <u>Completed Interviews</u>	39 <u>"IBM Not Seriously Considered" Interviews</u>
	IBM 46	DEC 20
	DEC 12	HP 6
	HP 8	Others 13
	Others 19	

B.

46 Subsequent Focus on Additional DEC (21) and HP(25)
--

C.

<u>Final Results</u>					
108 <u>Completed Interviews</u>		62 <u>"IBM Not Seriously Considered" Interviews</u>	=	170 <u>Total Interviews</u>	
IBM 46		DEC 28		IBM 46	
DEC 25		HP 21		DEC 53	
HP 18		Others 13		HP 39	
Others 19				Others 32	
				170	



INTERVIEW MATRIX: COMPLETED INTERVIEWS

Company Type	Company Size			Total
	Very Large	Large	Small	
	>\$100M	\$10-100M	<\$10M	
Processing Services	t 10 a 10	t 20 a 14	t 15 a 30	t 45 a 54
Software House	t 10 a 6	t 20 a 21	t 15 a 12	t 45 a 39
Turnkey System	t 10 a 6	t 10 a 8	t 10 a 1	t 30 a 15
TOTALS	t 30 a 22	t 50 a 43	t 40 a 43	t 120 a 108

t = Target
a = Actual



**INTERVIEW MATRIX:
COMPLETED INTERVIEWS, PLUS
"IBM NOT SERIOUSLY CONSIDERED"**

Company Type	Company Size			Total
	Very Large	Large	Small	
	>\$100M	\$10-100M	<\$10M	
Processing Services	t 10 a 10	t 20 a 19	t 15 a 40	t 45 a 69
Software House	t 10 a 9	t 20 a 33	t 15 a 29	t 45 a 71
Turnkey System	t 10 a 9	t 10 a 17	t 10 a 4	t 30 a 30
TOTALS	t 30 a 28	t 50 a 69	t 40 a 73	t 120 a 170

t = Target
a = Actual



INTERVIEW MATRIX, VENDOR POPULATION (N = 89)

Completed Interviews (Random Only)

Company Type	Company Size (\$M Revenues)			
	Very Large >\$100M	Large \$10-100M	Small <\$10M	Totals
Processing Services	DEC 5	DEC 1	DEC 6	DEC 12
	HP 1	HP --	HP 6	HP 7
	IBM 4	IBM 7	IBM 13	IBM 24
Software Products	DEC 2	DEC 1	DEC 4	DEC 7
	HP --	HP 4	HP 6	HP 10
	IBM 2	IBM 13	IBM 1	IBM 16
Turnkey Systems	DEC 2	DEC 3	DEC 1	DEC 6
	HP 1	HP --	HP --	HP 1
	IBM 3	IBM 3	IBM --	IBM 6
TOTALS	DEC 9	DEC 5	DEC 11	DEC 25
	HP 2	HP 4	HP 12	HP 18
	IBM 9	IBM 23	IBM 14	IBM 46
				89



INTERVIEW MATRIX, VENDOR POPULATION (N = 138)

Completed Interviews, Plus "IBM Not Seriously
Considered" Responses

Company Type	Company Size (\$M Revenues)			
	Very Large >\$100M	Large \$10-100M	Small <\$10M	Totals
Processing Services	DEC 5 HP 1 IBM 4	DEC 3 HP 2 IBM 7	DEC 9 HP 10 IBM 13	DEC 17 HP 13 IBM 24
Software Products	DEC 5 HP 0 IBM 2	DEC 8 HP 8 IBM 13	DEC 10 HP 15 IBM 1	DEC 23 HP 23 IBM 16
Turnkey Systems	DEC 2 HP 3 IBM 3	DEC 8 HP 0 IBM 3	DEC 3 HP 0 IBM --	DEC 13 HP 3 IBM 6
TOTALS	DEC 12 HP 4 IBM 9	DEC 19 HP 10 IBM 23	DEC 22 HP 25 IBM 14	DEC 53 HP 39 IBM 46 <u>138</u>



FUTURE PURCHASE INTENTIONS

Percent of respondents planning to buy or upgrade internal systems from current manufacturer in the future		
Manufacturer Currently Used	Will Buy In 12 months (Percent)	Will Buy In 36 months (Percent)
DEC (53)	34	32
HP (39)	31	36
IBM (46)	41	35



PRIMARY INSTALLED SYSTEMS

Responses

DEC

• VAX 730, 570, 780	26
• Microvax 2, 2000	11
• VAX 80XX	9
• PDP 11/70	6
• KL10	<u>1</u>
	53

HP

• 3000	38
• 930	<u>1</u>
	39

IBM

• 4331, 4341	14
• System 36	10
• 4381	8
• System 38	8
• 9370	4
• System 34	1
• PS/2	<u>1</u>
	46



INFORMATION SYSTEMS VENDORS USING MULTIPLE-MFG'S INTERMEDIATE SYSTEMS FOR INTERNAL USE

Manufacturer of Primary Internal System	Number of Sites Using Another Mfg.	% of Sites Using More Than One Mfg.
IBM (46)	DEC 4 HP 2 Other 12 <u>Total 18</u>	39
DEC (53)	IBM 4 HP 2 Other 8 <u>Total 14</u>	26
HP (39)	IBM 1 DEC 1 Other 5 <u>Total 7</u>	18



CONCLUSIONS

- Turnkey systems and software companies select internal systems to match clients' support/development needs and preferences.
- Processing services firms face a major task in changing equipment vendors. Porting client bases and software transparently is technically demanding.
- There are strong pressures on all IS firms to remain compatible with their current internal and client systems.
- DEC and HP are quality vendors whose "Satisfaction" ratings from customers are comparable to IBM's rating, with a few exceptions.
- Leverage through placement of IS firms' internal systems is significant. In software/turnkey firms, larger numbers of IS client systems can follow.
- IBM has a significantly higher ratio of respondents who will purchase in the future to those who will not.
- IBM has a better outlook than DEC or HP for 12-month purchases from current IS vendors.



RECOMMENDATIONS

- Focus on attracting VARS & IRs from DEC & HP ranks.
- Use 9370 and Silverlake as vehicles to attract midrange DEC VAX and HP 3000 IS companies.
- Introduce marketing/development incentives to entice HP/DEC loyalists to seriously consider a change:
 - Loaned or inexpensively priced development systems
 - Support from IBM sales force
 - Discounting for VARs
 - Program conversion aids
 - Strong promotions and marketing programs to aid IS firms in launching IBM-based software products and services.
- These programs should take advantage of perceived DEC/HP weak spots.

ZISC-14



REASONS INFORMATION SYSTEMS COMPANIES BUY INTERNAL SYSTEMS FROM MANUFACTURERS

% of Responses for
This Manufacturer

IBM

- | | |
|--------------------------|----|
| • Reliability | 15 |
| • Vendor Support | 11 |
| • Compatibility—Internal | 14 |
| • Compatibility—Clients | 11 |
| • Expansion Capability | 10 |

DEC

- | | |
|--------------------------|----|
| • Compatibility—Clients | 17 |
| • Compatibility—Internal | 16 |
| • Price Performance | 15 |

HP

- | | |
|--------------------------|----|
| • Compatibility—Internal | 16 |
| • Compatibility—Clients | 14 |
| • Reliability | 14 |
| • Migration & Expansion | 11 |



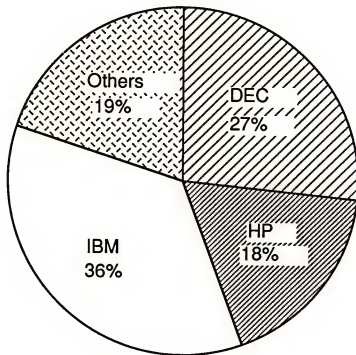
MOST IMPORTANT BUYING REASONS FOR INTERNAL SYSTEMS

Category	Responses per Manufacturer (Percent)		
	DEC (139)	HP (105)	IBM (132)
Price Performance	15	4	8
Performance	6	8	5
Price	2	2	6
Reliability	9	14	15
Vendor Support	7	6	11
Vendor Software	5	1	5
Compatibility with Existing Internal Systems	16	16	14
Compatibility with Systems Sold to Your Customer	17	14	11
Price Discounts	1	2	2
Migration Path	8	11	4
Expansion Capability	8	11	10
Third-Party Software	4	5	3
Vendor Reputation	4	5	5



**MANUFACTURERS SERIOUSLY CONSIDERED BY
INFORMATION SERVICES FIRMS IN MAKING
LAST (NEXT) COMPUTER SELECTION:**

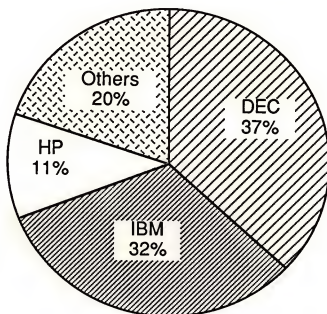
Responses from Total Survey
N=335





**MANUFACTURERS SERIOUSLY CONSIDERED BY
INFORMATION SERVICES VENDORS
IN MAKING LAST (NEXT) INTERNAL
COMPUTER SELECTION**

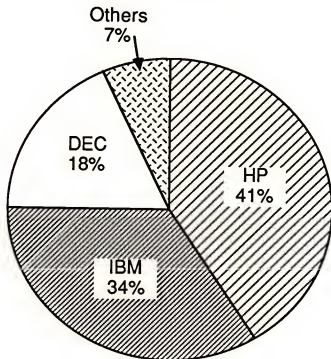
Response from DEC Internal System Users
N=65





**MANUFACTURERS SERIOUSLY CONSIDERED
BY INFORMATION SYSTEMS VENDORS
IN MAKING LAST (NEXT) INTERNAL
COMPUTER SELECTION**

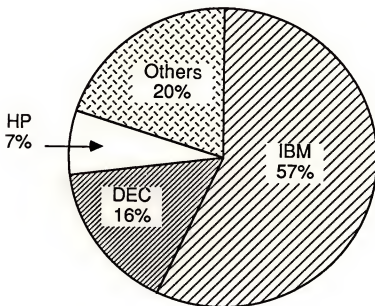
Response from HP Internal Systems Users
N=44





**MANUFACTURERS SERIOUSLY CONSIDERED
BY INFORMATION SERVICES FIRMS
IN MAKING LAST (NEXT) INTERNAL
COMPUTER SELECTION**

Response from IBM Internal Systems
Users
N=86





**OTHER MANUFACTURERS SERIOUSLY
CONSIDERED IN INFORMATION SERVICES
FIRMS' BUYING DECISIONS**

<u>Vendor</u>	<u>Number of Responses</u>
NAS	3
Amdahl	3
Unisys	2
Wang	2
Apple	2
Sun	1
Prime	1
Tandem	1
Honeywell	1

ZISC-21



**Q: UNDER WHAT CONDITIONS WOULD YOU
CONSIDER INTERNAL SYSTEMS VENDORS
OTHER THAN THOSE YOU NAMED?**

DEC Responses

of Responses

- | | |
|--|---|
| • PCs Cause System Obsolescence | 2 |
| • Client Software Compatibility | 2 |
| • Better Application Package | 1 |
| • Superior Architecture | 1 |
| • Service at Cheaper Price | 1 |
| • Move to Distributed Processing,
DEC as File Server for SUN WS | 1 |

HP Responses

- | | |
|---------------------------------|---|
| • Client Software Compatibility | 6 |
| • Move to PCs | 2 |
| • Better Price Performance | 1 |

ZISC-22



**INFORMATION SYSTEMS FIRMS'
OVERALL SATISFACTION RATINGS
FOR INTERNAL SYSTEM**

(0-10 Scale, 0 = Least Satisfied, 10 = Most Satisfied)

	Rating	Std. Deviation	Std. Error
IBM (39)	8.0	1.74	0.28
DEC (37)	7.7	1.59	0.26
HP (31)	8.1	1.37	0.24

ZISC-23



INFORMATION SYSTEMS FIRMS' SATISFACTION RATINGS FOR INTERNAL SYSTEMS

Scale of 0-10: 0=Very Unimportant, 10=Very Important

Vendor	Sales Support	Tech. Staff Support	Equip. Maint.	Software Maint.
IBM (46)	7.2	7.2	8.1	7.0
DEC (42)	6.1	6.8	7.7	7.1
HP (33)	6.8	7.8	9.0	7.5

Std. Error Ranges:

DEC 0.26-0.43

HP 0.18-0.38

IBM 0.17-0.33



INFORMATION SERVICES FIRMS' SATISFACTION RATINGS FOR INTERNAL SYSTEMS

Scale of 0-10: 0=Very Unimportant, 10=Very Important

Vendor	Price Perform.	Migration	Expansion	Ease of Use
IBM (46)	7.5	7.2	7.2	7.4
DEC (42)	7.4	7.8	7.7	7.4
HP (33)	7.3	8.6	8.3	8.0

ZISC-25



INFORMATION SERVICES FIRMS' SATISFACTION RATINGS FOR INTERNAL SYSTEMS

Scale of 0-10: 0=Very Unsatisfied, 10=Very Satisfied

Vendor	Networking	Software Avail.	Equip. Avail.	Reliability
IBM (46)	7.4	7.8	7.3	8.9
DEC (42)	8.1	7.0	7.1	8.7
HP (33)	7.6	7.1	7.9	9.4

ZISC-26



INFORMATION SERVICES FIRMS' IMPORTANCE RATINGS FOR INTERNAL SYSTEMS

Scale of 0-10: 0=Very Unimportant, 10=Very Important. Results
Rounded to Nearest Whole Number.

Vendor	Sales Support	Tech. Staff Support	Equip. Maint.	Software Maint.
IBM (46)	7	8	9	8
DEC (42)	7	8	8	7
HP (33)	7	9	9	7

ZISC-27



INFORMATION SERVICES FIRMS' IMPORTANCE RATINGS FOR INTERNAL SYSTEMS

Scale of 0-10: 0=Very Unimportant, 10=Very Important. Results
Rounded to Nearest Whole Number.

Vendor	Networking	Software Avail.	Equip. Avail.	Reliability
IBM (46)	8	7	9	8
DEC (42)	8	7	9	8
HP (33)	8	6	10	8

ZISC-28



INFORMATION SERVICES FIRMS' IMPORTANCE RATINGS FOR INTERNAL SYSTEMS

Scale of 0-10: 0=Very Unimportant, 10=Very Important. Results
Rounded to Nearest Whole Number.

Vendor	Price Perform.	Migration	Expansion	Ease of Use
IBM (46)	8	7	8	8
DEC (42)	8	8	8	7
HP (33)	7	8	8	8

ZISC-29



ELEMENTS OF GREATEST SATISFACTION TO INFORMATION SERVICES VENDORS, IN INTERNAL SYSTEMS USAGE

DEC (53)

- Migration Capability (11)
- Reliability (6)
- Expansion Capability (4)
- Price Performance (4)

HP (39)

- Reliability (9)
- Migration Capability (5)
- Networking (4)
- Technical Staff Support (4)

IBM (46)

- Equipment Maintenance (8)
- Reliability (8)
- Software Availability (5)
- Ease of Use (4)



ELEMENTS OF GREATEST DISSATISFACTION TO INFORMATION SERVICES VENDORS, IN INTERNAL SYSTEMS USAGE

DEC (53)

- Sales Support (13)
- Price Performance (4)
- Software Availability (4)
- Ease of Use (4)

HP (39)

- Sales Support (6)
- Networking Capability (5)
- Software Availability (4)

IBM (46)

- Sales Support (7)
- Migration Capability (5)
- Software Maintenance Support (5)



ELEMENTS OF GREATEST IMPORTANCE TO INFORMATION SERVICES VENDORS, IN INTERNAL SYSTEMS USAGE

DEC (53)

- Sales Support (9)
- Technical Staff Support (6)
- Networking (6)
- Expansion Capability (5)

HP (39)

- Technical Staff Support (6)
- Migration Capability (6)
- Networking Capability (6)

IBM (46)

- Reliability (6)
- Technical Staff Support (4)
- Networking Capability (4)
- Software Availability (4)



ELEMENTS OF LEAST IMPORTANCE TO INFORMATION SERVICES VENDORS, IN INTERNAL SYSTEMS USAGE

DEC (53)

- Sales Support (13)
- Software Availability (8)
- Software Maintenance Support (4)

HP (39)

- Software Availability (7)
- Software Maintenance (6)

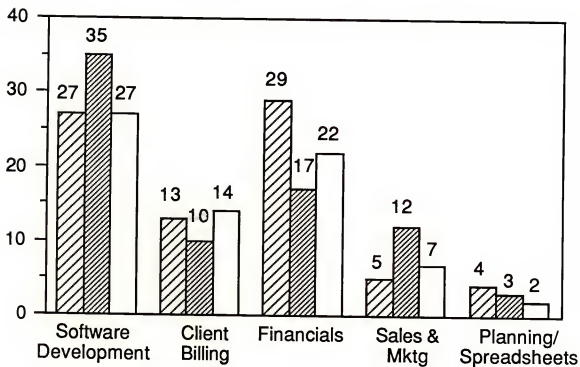
IBM (46)

- Sales Support (10)
- Networking (6)
- Migration Capability (4)



MOST IMPORTANT APPLICATION BEING PERFORMED ON INFORMATION SERVICES FIRMS' INTERNAL SYSTEMS

Percent of Respondents, by Vendor





**OTHER APPLICATIONS BEING PERFORMED
ON INFORMATION SERVICES FIRMS'
INTERNAL SYSTEMS**

<u>DEC</u>	<u>% of Responses</u>
• Word Processing	3
• Seismic Data Processing	2
• Client Processing	2
 <u>HP</u>	
• Manufacturing Systems	4
• Utility Timesharing	4
• Office Automation	2
 <u>IBM</u>	
• Manufacturing Systems	3
• Client Processing	2
• Insurance Claims	2



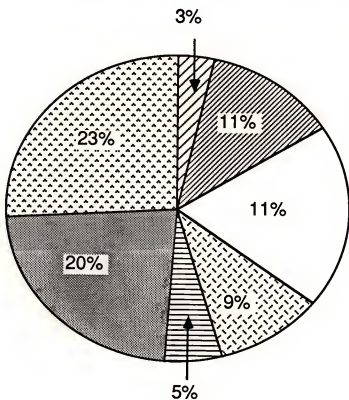
SOURCES OF INTERNAL APPLICATIONS

	Responses (Percent)			
	Internal Develop.	Software Package	Custom Software	Equipment Manuf.
DEC (50)	80	18	2	-
HP (45)	71	29	-	-
IBM (62)	65	29	3	3
Total Survey	71	25	3	2

ZISC-36



OPERATING SYSTEMS IN USE; INFORMATION SERVICES FIRMS' INTERNAL SYSTEMS



- IBM CPF
- IBM VM
- IBM MVS
- DOS
- UNIX
- HP MPE
- DEC VMS
- OTHER 18%



SOURCES OF INTERNAL SYSTEMS

Number of Responses				
Vendor Name	Manufacturer	Dealer	VAR	Broker
DEC (51)	37	9	1	4
HP (33)	27	3	2	1
IBM (50)	32	9	1	8
	<hr/>	<hr/>	<hr/>	<hr/>
	96	21	4	13



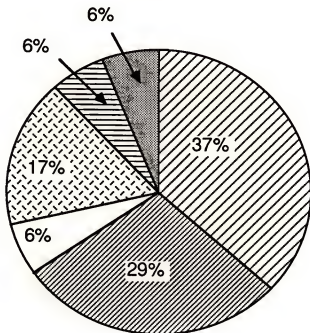
INFORMATION SYSTEMS VENDORS' COMPLEMENTARY RELATIONSHIPS WITH MANUFACTURERS OF THEIR INTERNAL SYSTEMS

	Responses (Percent)				
	VAR	IMAP	Distributor	OEM	Total
DEC (53)	8	-	2	15	25
HP (39)	31	-	-	5	36
IBM (49)	27	8	-	2	37



REASONS FOR INFORMATION SERVICES COMPANIES CONTINUING TO PURCHASE FROM DEC

N=35

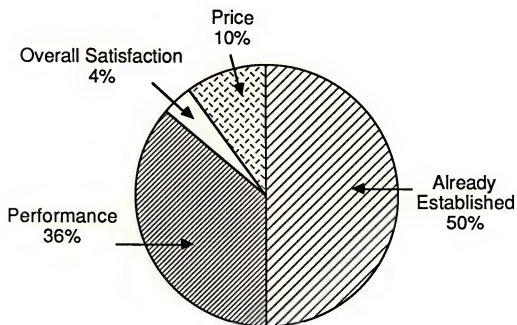


- ☒ Already Established on This Equipment
- ☒ Performance
- ☐ Service & Support
- ☒ Overall Satisfaction
- ☒ Price Performance
- ☒ Vendor Reputation



REASONS FOR INFORMATION SERVICES COMPANIES CONTINUING TO PURCHASE FROM HP

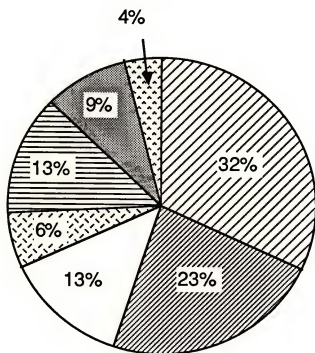
N=30












REASONS FOR INFORMATION SERVICES COMPANIES CONTINUING TO PURCHASE FROM IBM

N=47

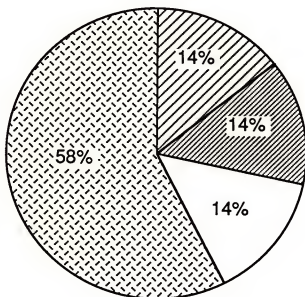





-  Already Established on This Equipment
-  Performance
-  Service & Support
-  Overall Satisfaction
-  Price (Third Party)
-  Vendor Reputation
-  Price Performance



**REASONS FOR
INFORMATION SERVICES COMPANIES
PLANNING TO CHANGE
FROM IBM FOR INTERNAL SYSTEMS**

N = 7

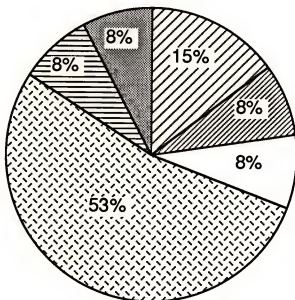


-  Price
-  Performance
-  Support
-  Third-Party Prices



REASONS FOR INFORMATION SYSTEMS COMPANIES PLANNING TO CHANGE FROM DEC FOR INTERNAL SYSTEMS

N=13

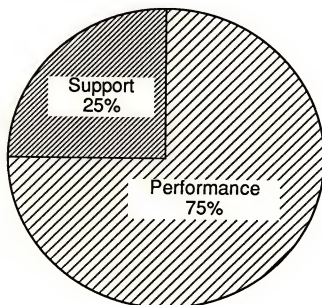


- ☒ Compatibility
- ☒ Price
- ☐ Price-Performance
- ☒ Performance
- ☐ Support
- ☐ Reputation



REASONS FOR INFORMATION SYSTEMS COMPANIES PLANNING TO CHANGE FROM HP FOR INTERNAL SYSTEMS

N=4





**INFORMATION SERVICES COMPANIES PLANNING
TO CONTINUE/NOT CONTINUE TO
PURCHASE FROM CURRENT MANUFACTURER**

Number of Responses			
Manufacturer	Will Cont.	Will Not Cont.	Ratio, Will:Will Not Continue
DEC	35	10	3.5
HP	31	4	7.8
IBM	48	3	16.0

The first part of the paper discusses the importance of understanding the underlying mechanisms of the observed phenomena. This is followed by a detailed analysis of the data, which reveals several key findings. The results indicate that the proposed model is highly effective in capturing the essential features of the system under study. Furthermore, the analysis shows that the model's performance is robust across different parameter settings and data distributions. The final section of the paper concludes with a summary of the findings and suggests directions for future research.

The second part of the paper focuses on the theoretical aspects of the problem. It begins by defining the key concepts and terms used throughout the study. This is followed by a rigorous proof of the main theorem, which establishes the validity of the proposed model. The proof is based on a series of lemmas and propositions, which are carefully derived and verified. The final part of the section discusses the implications of the results and their potential applications in various fields.

The third part of the paper presents a series of experiments designed to evaluate the performance of the proposed model. These experiments are conducted using a variety of datasets and parameter configurations. The results show that the model consistently outperforms existing methods in terms of accuracy and efficiency. This is particularly evident in the case of complex, high-dimensional data, where the model's ability to capture underlying patterns is crucial. The experiments also demonstrate the model's scalability and its ability to handle large-scale data efficiently.

The fourth part of the paper discusses the limitations of the current study and suggests potential areas for future work. While the proposed model shows promising results, there are still several challenges that need to be addressed. For example, the model's performance may be affected by certain types of noise or outliers in the data. Future research could focus on developing more robust versions of the model that are less sensitive to such issues. Additionally, it would be interesting to explore the model's performance in real-world applications, where the data is often more complex and noisy than in the controlled environments used in the experiments.